

**ABSTRACT**

The invention is directed to a system for determining a transfer function for emphasizing an electromagnetic signal prior to being processed by determining a discrete transfer function for a processing system, such as a wideband phase modulator; determining a target transfer function such that the target transfer function multiplied by the inverse of the discrete transfer function produces a discrete pre-emphasis transfer function; and transforming any unstable poles and/or zeros in the pre-emphasis transfer function to stable poles and/or zeros. The discrete transfer function may be determined, for example, by using an S-function, input and output signals, the inverse-invariant method, and/or the Steiglitz-McBride algorithm. The transformation of the unstable poles and/or zeros may be accomplished using an all pass filter. The target transfer function may be a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.